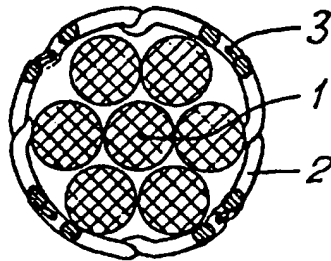


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(71)(72) Applicant and Inventor: NORDBERG, Fred [SE/SE]; Koppargatan 19, S-426 71 Västra Frölunda (SE).		Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments. In English translation (filed in Swedish).</i>	
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(54) Title: ELECTRIC FENCE DEVICE			
(57) Abstract			
<p>Electric fence for enclosed pasture-land are known and appreciated for being simple and effective. They, however, suffer from the disadvantage that young domestic animals and wild animals sometimes rush on to the fence which thereby breaks before the animal has had time to slow down. Before the damage is noticed the cattle may scatter and cause great damage on surrounding fields. The invention eliminates the disadvantage in a simple and economic way by providing a device mainly being characterized in that one or several electrically conductive threads (3) are associated with an elastic material (1) in such a way that the threads and the material together form a string which is considerably but restrictedly elastically stretchable, which is electrically conductive on at least parts of its surface, and which together with posts (5, 6) comprise an enclosure.</p>			
			

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ELECTRIC FENCE DEVICE

Electric fences for enclosed pasture-land are previously known and appreciated for being simple and effective. They consist of
5 a grounded mains- or battery-operated pulse generator for high voltage and low power and, connected thereto, a smooth metallic wire which is carried by insulating poles so as to surround the enclosed pasture-land. At first contact with the wire the domestic animals learn that it gives an unpleasant electric
10 chock and thereafter avoid subsequent contact. To date simple stainless metallic wire has been used as wire material, in more sophisticated applications woven into a thin ribbon, which makes it more visible. The previously known type of electric fences have however, a considerable disadvantage. Young domestic
15 animals which have not yet come into contact with the electric fence often approach it with such a speed that they are not restricted by the electric chock before the wire has already been torn off by their rush. The same situation applies to wild animals striving to pass the fence and not being aware
20 of its effect. This way openings in the fence will occur and the cattle will scatter before the owner has observed the damage. The animals may then destroy valuable cultivations and cause work and trouble for the owner. The invention is a safe and economic solution to this and other problems. It is mainly
25 characterized in that one or more electrically conductive wires are associated with an elastic material in such a way that the wires and the material together form a considerably but restricted and elastically stretchable string, which is electrically conductive at least on parts of its surface, and which
30 together with the poles comprise the enclosure.

The invention will now be described by way of an embodiment according to the annexed drawing, wherein

35 Fig. 1 shows a section of the string

Fig. 2 shows the string in a side view

Fig. 3 shows a portion of the enclosure

Fig. 4 shows a portion of the enclosure in a horizontal section.

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According to Fig.1 an elastic and electrically conductive string is formed around a synthetic rubber core 1 which preferably is divided into several treads, an envelope of tubular braided plastic threads 2 and a number of metal threads 3 included in the braid. The plastic material is preferably a high quality polyamide, e.g. one being known under the commercial denomination 6006, and is treated against UV-radiation degradation. The metallic thread is comprised of stainless steel with a diameter of 0.15 - 0.3 mm. The tubular braid allows the string to be stretched out to the length where the plastic threads 2 lie against each other in an almost longitudinal direction and it is dimensioned such with respect to the core 1 that the latter thereby is stretched to about two times its length in the state of rest. The outer diameter of the string is about 4 mm in its state of rest. A string which is formed in such a way is electrically conductive by the metallic threads being braided into its surface and is elastically stretchable because of the association between the rubber core and the braided envelope, but the stretchability is restricted by the lengths of the plastic threads. In order to secure the association between the core and the envelope, the string should be provided with a knot near all free ends. The properties of the string makes it ideal for replacing previously used metallic wires and ribbons in electric fences. It is thereby preferably hung on a post according to Fig. 3 which is comprised of a piece of a thin X-profile 5 of carbon fibre reinforced plastic material and which is provided with a pointed end 6 for pressing down into the ground and a movable attachment means 7 for the string. The attachment means 7 has the same shape as a boat anchor and is positioned obliquely with respect to the profile 5 in order to allow it to be hooked together with a similar attachment means of a neighbouring post of the same type as is illustrated on Fig. 4. The purpose of

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this is to provide the easiest way of arranging an easily opened place in the fence. The strings which are tied around the respective attachment means contact each other by this hooking together and thereby provide electrically conductive connection. If the post carrying the upper attachment means is slightly pressed down into the ground, it is simple to simultaneously pull it out from the ground and from the mutual connection between the attachment means so as to open the fence. Since both the profile 5 and the attachment means 7 are made from electrically insulating materials, the post may be gripped and lifted simply by the hands.

When mounting the fence the string is stretched to about 3/4 of its possible length and is successively attached to the previously mounted posts, which are placed 15 - 20 m apart, by winding it one turn around the attachment means 7. By the fence being mounted this way the risk of it being run down by rushing animals is eliminated because its stretchability gives the animals time to slow down under the influence of the electric shocks from the string. The animal is not injured and the string will stretch it self straight again when the animal changes direction. The considerably better visibility of the string compared to a simple metal wire also reduces the risk of the animals running on to it. This may be enhanced by using plastic threads in several different colours in the envelope of the string.

Even if the above described embodiment of an elastic string is the most qualified for the intended use, the scoop of this invention also encloses several other embodiments. In its most simple form it is a rubber string which by mixing or impregnation with electrically conductive material is provided with a sufficient conductivity for the high voltage electrical pulses also on the surface. In another embodiment very thin threads of metal are mixed with equally thin threads of synthetic fibres and spun according to the method known from the knitwear industry such as to result in a so called tricot string. Such a string has a considerable elastic stretchability and may be

twisted together to the thickness and strength necessary for electric fences. Alternatively such a string may be used for spinning around a rubber core. Moreover, a smooth steel wire which is wound into a helical spring and surrounds a rubber
5 core may form the desired string.

Naturally all mentioned embodiments of elastic strings may be used in combination with other kinds of posts and attachments than the ones mentioned above.

C L A I M S

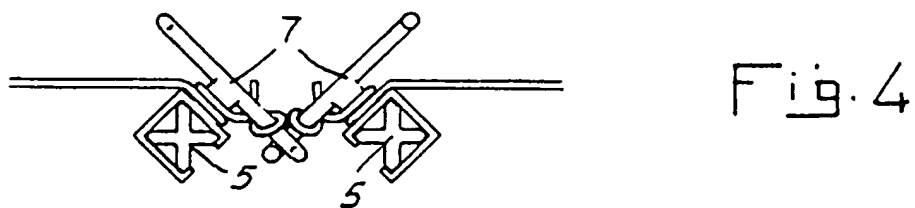
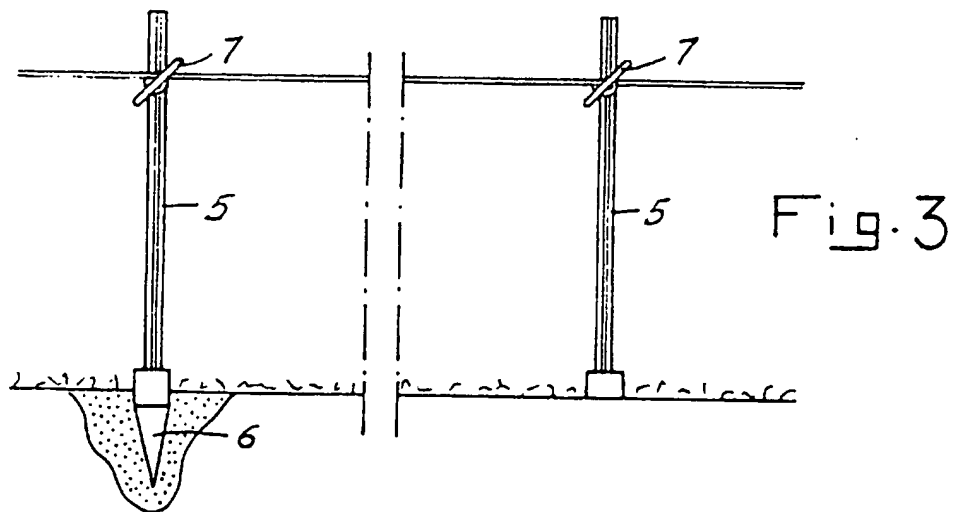
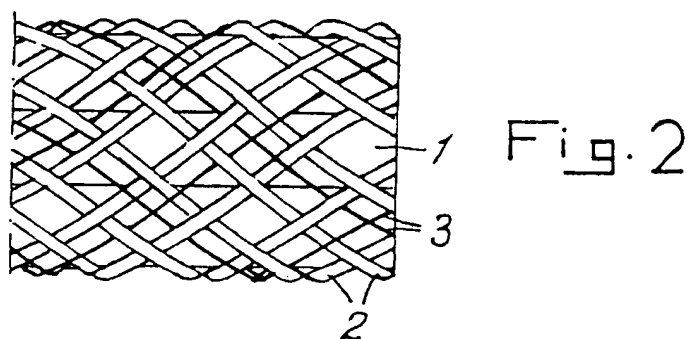
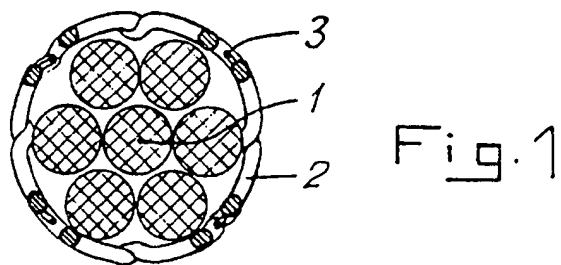
1. Electric fence device including a generator for high voltage
5 electric pulses and a metallic enclosure connected thereto,
c h a r a c t e r i z e d in that one or several electrical-
ly conductive threads (3) are associated with an elastic
material (1) in such a way that the threads and the material
together form a string which is considerably but restricted and
10 elastically stretchable, which is electrically conductive on at
least parts of its surface, and which together with posts (5,6)
comprise the enclosure.

2. Device according to claim 1, c h a r a c t e r i z e d in
15 that the conductive threads (3) are mixed with non conductive
plastic threads (2) and arranged as a tubular braid around a
rubber core (1), the length of which in the free state being
about half the length of the tubular braid in its stretched
state.

3. Device according to claim 1 or 2, c h a r a c t e r i z e d
20 in that the posts are provided with movable anchor-shaped
attachment means (7) for the string.

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SE95/0101.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 95/01012

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A01K 3/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A01K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPAT, JAPIO

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	DE 4402144 A1 (AUGUST MOHR GMBH & CO), 22 Sept 1994 (22.09.94), column 2, line 10 - column 3, line 15, figures 1-3 -- -----	1

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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DE-A1- 4402144	22/09/94	NONE	